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CENTRAL INTELLIGENCE AGENCY

INFORMATION REPORT

COUNTRY Tatar ASSR

DATE DISTR. 4 Feb 1953

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SUBJECT Oil Drilling in the Shugurskiy Rayon

NO. OF PAGES 5

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PLACE ACQUIRED

NO. OF ENCLS. 4 (LISTED BELOW)

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DATE ACQUIRED

SUPPLEMENT TO REPORT NO.

50X1

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1. 50X1

Drilling operations with each of the two methods are as follows:

(a) Turbine method. Fundamentally, the turbine method of drilling uses the same drilling equipment as the rotary method. That is, the rig, the derrick and the operating principle were the same. Drilling with the turbine method, the entire drill column and the rotary table did not turn or show evidence of any spinning or drilling motion. The only motion that the drill column possessed was the downward motion as the drilling progressed. Attached to the extreme end of the drill column, in the ground, were three, sometimes four, round ball-like drills with various sized cutting edges as well as overall sizes. These ball-like drills (shariki) were the only circular (spinning) moving parts in this operation and they were the parts which actually did the drilling. Although I am unable to explain in detail the procedure, these ball-like drills were forced to spin and drill by having a mixture of water, sand and soda applied to them under a pressure of approximately 150 tons. This pressure was supplied by a Diesel engine, with an approximate 400 horsepower rating, which forced this mixture down the drill column through a heavy duty, reinforced rubber hose which extended from the mixture pit to the derrick and via a steel pipe down the column to the ball-like drills. This mixture, with the applied pressure behind it, forced these ball-like drills to spin and produce the drilling action. The expended mixture was forced up a return pipe to the mixture pit with the aid of suction created by another Diesel engine with the same horsepower rating as the one indicated above and located right next to that engine, and the cycle repeated itself. This mixture of water, sand and soda had no specific proportions. It was tested by hand and when it made a smudge on a finger, the mixture was considered to be right. The 150-ton pressure behind the mixture was the official maximum pressure allowed by the government. Any damages or accidents that occurred within that pressure maximum, was

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not the direct responsibility of the driller. However, that pressure limit was exceeded at times and if any damages or accidents ensued, the driller was held directly responsible and any damages were deducted from his pay. [redacted] allowed eight months by the government to drill and finish one well. Barring any unforseen difficulties, such as drill breaks and abandonment of the site, we could finish in the allcted time. On very rare occasions, [redacted] finished a well before the dead line and then received a small bonus. 50X1

(b) Rotary method. [redacted] this method used the same basic equipment and operated in the exact same manner with the exception that the rotary table and the entire drill column from the top to the extreme bottom, rotated during the drilling operation. 50X1

2. [redacted]

One of the major differences between the [redacted] two methods was that the turbine method was more economical than was the rotary method. In the turbine method, only two Diesel engines had to be operated all the time (those engines which pumped the mixture) whereas four Diesel engines had to be operated all the time in the rotary method. In the rotary method, two engines pumped the mixture both ways, the third supplied the power for the drilling and the fourth operated the winch. It was also a more economical and beneficial method because fewer drill breaks and other slowing down procedures occurred since the entire drill column turned; during the turbine method of operation, the drill column did not turn but was held stationary; only the drill bits turned. Another feature which favored the turbine method over the rotary method was the fact that the turbine operation was faster. In eight hours of operation, the turbine method doubled the depth obtained in the same time of rotary operation. 50X1

3. [redacted]

The electricity that was produced was used exclusively for lighting purposes. My engineer instructor mentioned the fact that electricity was used for powering the drill at some fields in the USSR. I can not offer any further information regarding electric power drilling. At the field where I worked, only the above mentioned methods were employed. 50X1

4. [redacted]

(a) The rotary table. (See Enclosure (A)) The rotary table consisted of a circular steel table approximately 1.5 m in diameter, 50 cm thick with two parts, each part subdivided into two sections that were removable. From the center of the table, one of the removable parts had an approximate radius of 20 cm. This section was the drive joint. The other removable part was approximately 40 cm wide. The remaining 15 cm was secure. This table, (the entire arrangement rotated during rotary operation but remained motionless during turbine operation. 50X1

(b) Pipe tongs. /See Enclosure (B)/. These were all metal pipe-wrench-like instruments that were used for tightening and untightening the pipe sections. None of the drill column pipe sections were hand carried; but were lifted and carried to the derrick with the aid of a cable and winch.

(c) Turbine drill bits. /See Enclosure (A)/. These drill bits were constructed of hard steel and formed a triangle. At the corners was attached a ball-like structure with sharp, jagged edges. These drill bits ranged from 5.75 cm to 25.75 cm in size. During turbine operation, only the ball-like structures rotated in the manner described above.

(d) Rotary drill bits. /See Enclosure (A)/. These bits were identical to those utilized in turbine operation with the exception that the entire assembly rotated.

(e) Draw-works or winch. The winch was operated by a Diesel engine which was located next to the Diesel engine which supplied the drilling power. It was approximately a 400 horsepower Diesel engine. The cable was approximately an inch and a half thick and was wound around a steel cylinder attached to the engine and had lines leading to the top of the derrick.

(f) Casing pipe program. Steel smokestack pipe of three different sizes was used for the casing program. When the drilling reached the 100 m level, a 50 m length of pipe, approximately 50 cm in diameter, was sunk and packed with cement. At the 300 m drilling level, 150 more meters was cased with pipe approximately 40 cm in diameter and packed with cement. Again, at the one thousand m drilling level, 800 more meters was cased with pipe approximately 30 cm in diameter and packed with cement. From that point, the drilling proceeded without any casing.

(g) Swivel and hook. /See Enclosure (C)/. The swivel and hook was suspended by a block and tackle from the top of the derrick. The uppermost block consisted of five wheels and the lower block had four wheels. The steel hook, approximately 30 cm long, was attached to the lower block from which the swivel was suspended. The all steel swivel was approximately one m long and 80 cm wide at the widest point. At the base of the swivel, the top portion of the drill column (the rectangular portion of the drill column to which the pipe sections were connected) was attached in such a way where in only that portion of the swivel rotated.

(h) Kelly pipe joint. /See Enclosure (D)/. This drive joint was constructed of steel in such a manner that it fitted snugly around the rectangular portion of the drill column which was extended from the swivel hook, passed through the rotary table and attached to the circular drill pipe section. That rectangular portion of the drill column, was approximately seven m long and was always within the opening of the rotary table. Those portions of the rotary table /Point #1, Encl (D)/ fitted snugly on all sides of the rectangular section of the drill column. When the limits of the rectangular portion of the drill column had been reached and it became necessary to withdraw the entire drill column to such an extent as to enable the addition of a new pipe section, these pieces automatically lifted out with the withdrawing action. After the pipe section had been attached, the rectangular portion of the drill column was replaced in the opening, the drive joints /Point #1, Encl (D)/ were replaced by hand and the drilling was resumed.

4.

5.

6.

These pumps were operated by Diesel engines with an approximate 400 horsepower rating and were almost continually operated at full speed to produce the 150-ton pressure behind the mixture. At times, the speed was increased to the limit so as to produce an approximate 175-ton pressure. However, this was only done at the driller's discretion and risk when it appeared to him that more than the maximum pressure allowed was needed.

7.

There was no specific RPM used in either method. In soft formations, less power was used than in hard formations. Using the rotary method, the Diesel engines which powered the drilling were operated at the maximum speed in hard formations. In the turbine method, the Diesel engines which pumped the mixture and supplied the pressure were also operated at the maximum speed in hard formations.

8.

all the drilling equipment was old.

9.

Spare parts were available in sufficient quantities. The only time that the operation was held up for any length of time was when a drill broke and it became necessary to withdraw and re[illegible]e or completely abandon the site and start anew. Otherwise, spare parts and repairs were readily obtainable.

10.

Nothing was used to add weight and rigidity to the drilling column.

11.

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12. [redacted]

With the present equipment, I assume that they could obtain a depth of approximately 2500 m. However, they usually drilled to a depth of 1800 m and stopped. They struck oil at 1200 m but unless otherwise instructed from Moscow, always continued drilling to 1800 m where a better grade of oil was found. To the best of my know50X1 ledge, they never had to drill any deeper.

13. [redacted]

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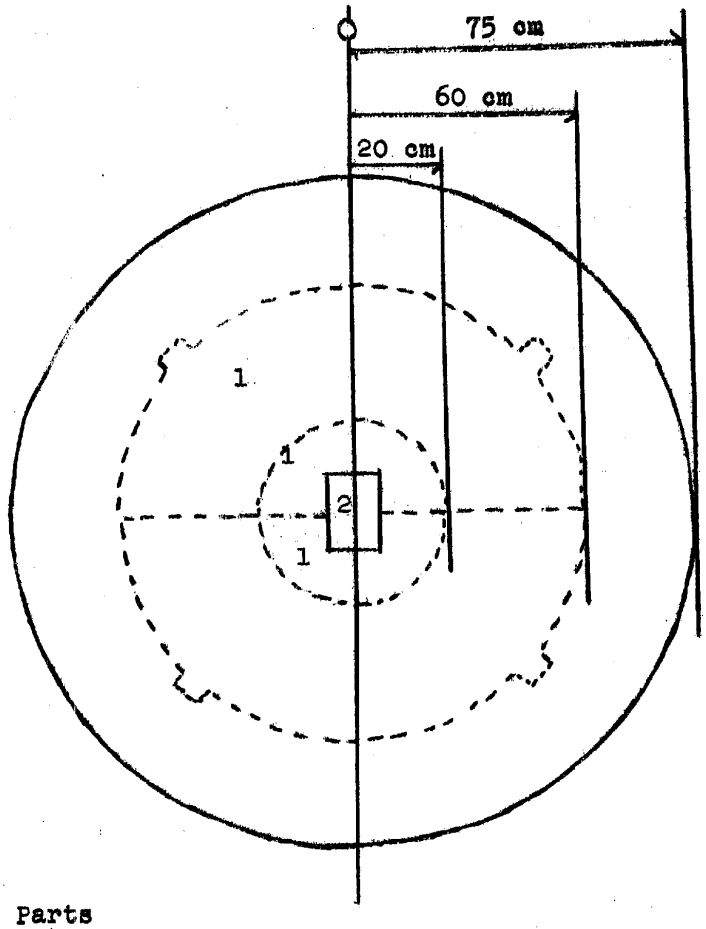
Encl (A): [redacted] sketch of Rotary Table and Drill Bits 50X1
(B): sketch of Wrench-like Instruments
(C): sketch of Swivel and Hook
(D): sketch of Drive Joint (Kelly Pipe Joint)

Enclosure (A) SECRET/SECURITY INFORMATION

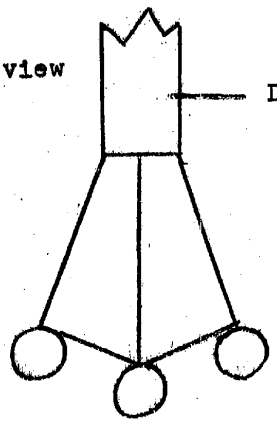
Rotary Table

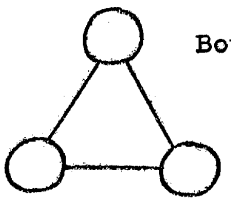


1. Removable Parts
2. Opening

Drill Bits

Side view





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Sketch of Rotary Table and Drill Bits

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Enclosure (B)

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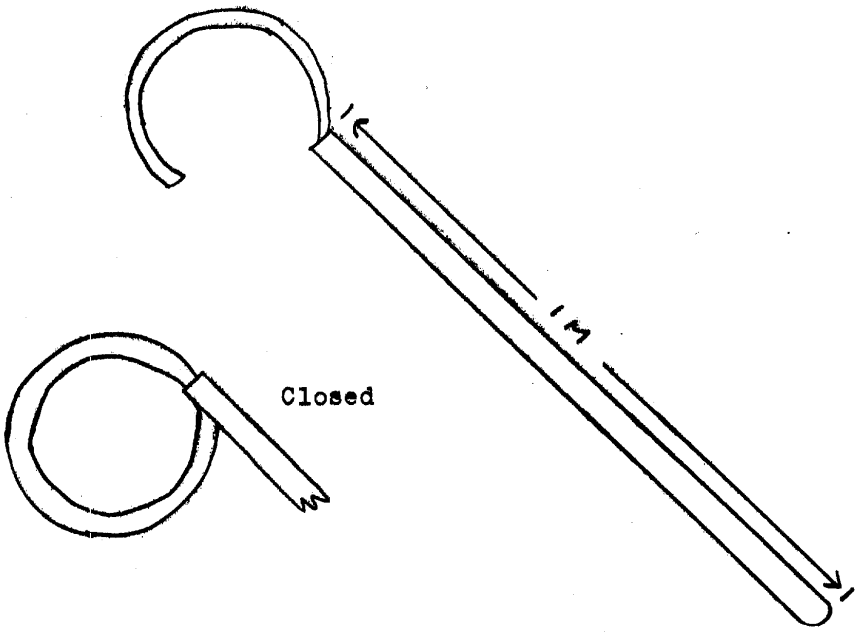
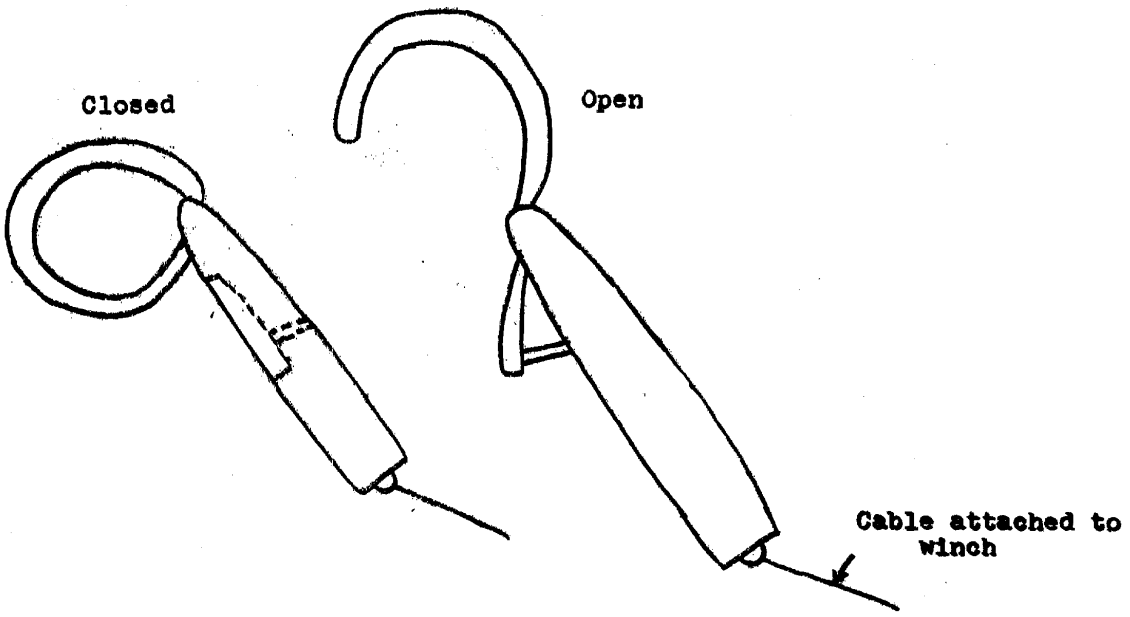
Hand Tool



Machine Tool



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Sketch of Wrench-like Instruments (pipe tongs)

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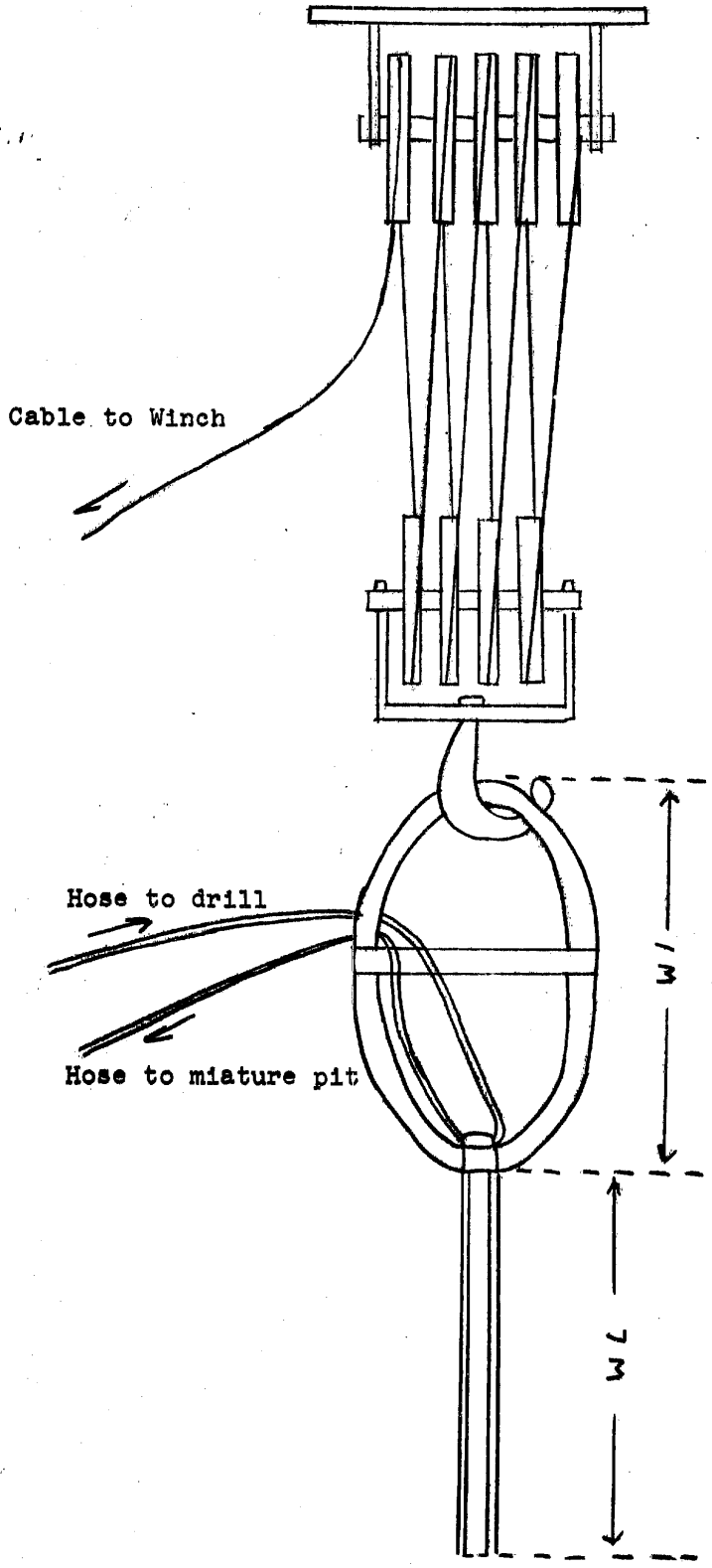
Enclosure (C)



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Sketch of Swivel and Hook

Enclosure (D)

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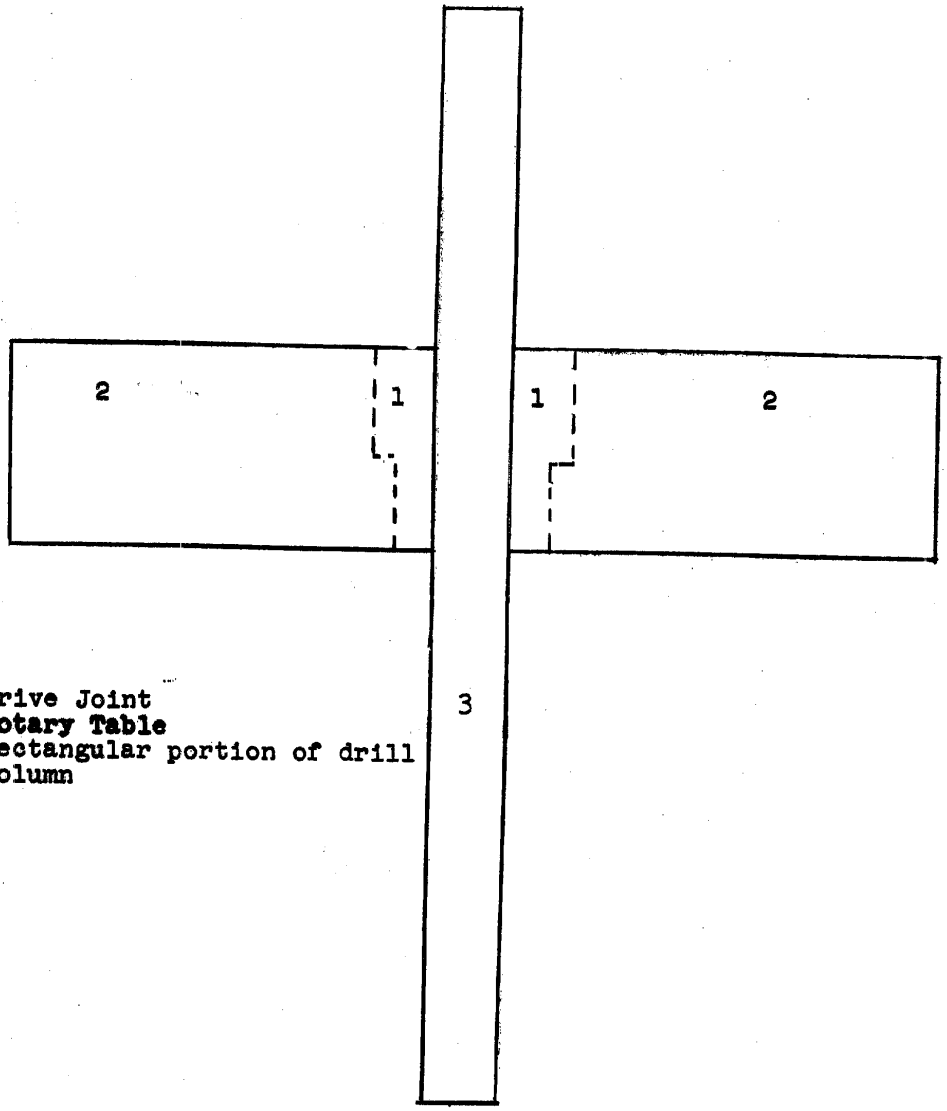

1. Drive Joint
2. Rotary Table
3. Rectangular portion of drill column

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Sketch of Drive Joint (cross-sectional view)

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